Service Manual
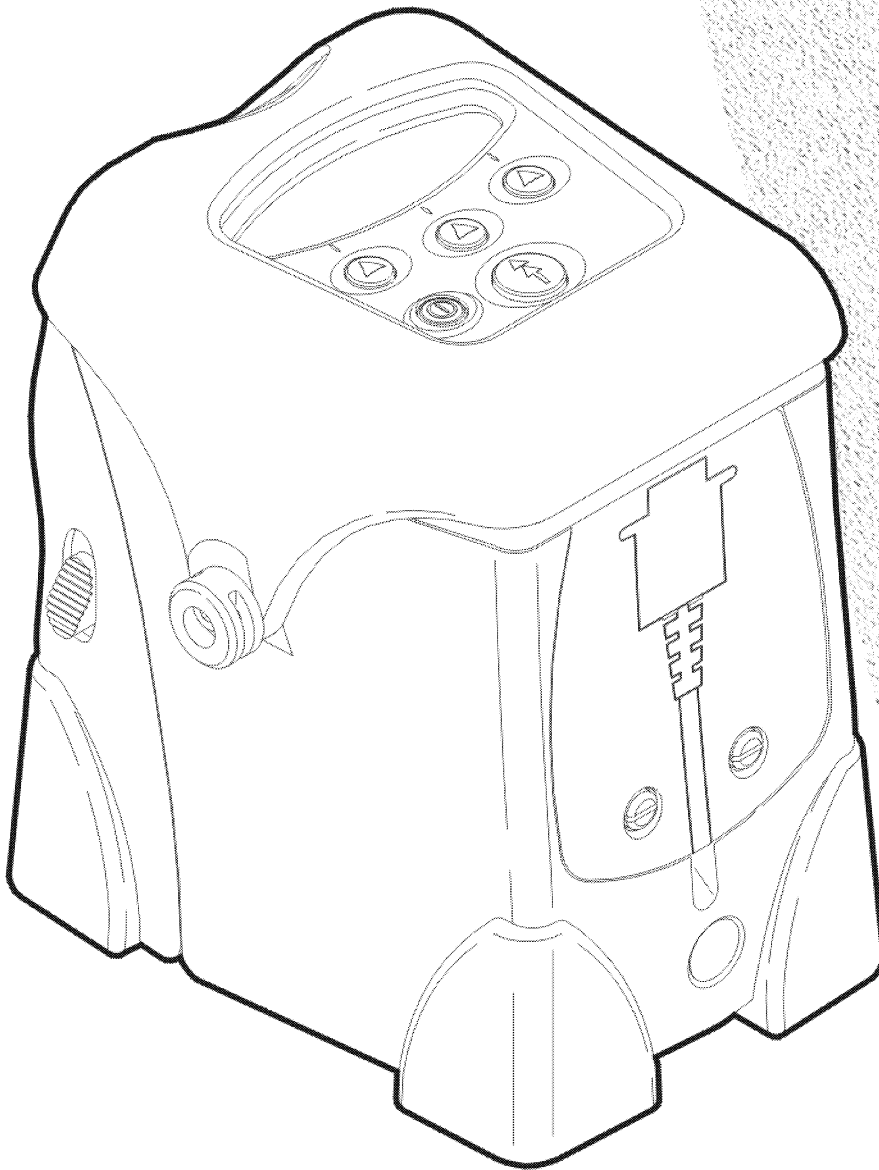
Monarch®

PAXAR

Each product and program carries a respective written warranty, the only warranty on which the customer can rely. Monarch reserves the right to make changes in the product, the programs, and their availability at any time and without notice. Although Monarch has made every effort to provide complete and accurate information in this manual, Monarch shall not be liable for any omissions or inaccuracies. Any update will be incorporated in a later edition of this manual.

WARNING

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

CANADIAN D.O.C. WARNING

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans le Réglement sur le brouillage radioélectrique édicte par le ministère des Communications du Canada.

SAFETY SUMMARY

Warning and caution messages appear throughout this manual. They alert you to potential safety hazards or potential damage to equipment. The messages and their meanings are shown below.

<u>**WARNING**</u>

Calls attention to improper practices that could result in a potentially serious, even lethal injury.

<u>**CAUTION**</u>

Calls attention to practices that could cause minor injury or damage to equipment.

Familiarize yourself with proper procedures before operating or repairing the equipment. Follow these precautions for your own safety and to protect the equipment.

Equipment Safety

Your body is a giant capacitor. It can store several thousand volts of electricity. Digital equipment is easily damaged or destroyed by this static electricity. You do not have to see a spark to ruin an IC; 50 volts is enough. To protect the equipment from static damage, follow these guidelines:

Ground yourself before reaching into the equipment or touching any circuit board or other electrical component. The Monarch Static Ground Kit contains everything you need.

Re-ground yourself whenever you walk away and return to the equipment. Be especially careful around carpet. Carpet is a major source of static buildup in the body. Even a few steps can recharge you.

The smaller the object, the greater the precautions must be. A board in the machine is better protected than one that is not plugged in. A chip on a board is better protected than one in your hand.

Avoid touching pins coming out of a chip or the connector edge of circuit boards. These metal parts have signal and data lines that are connected directly to fragile circuits.

Table of Contents

List of Figures

List of Tables

CHAPTER 1. PRINTER OVERVIEW & INSTALLATION

PURPOSE

This manual contains information service technicians need to service, troubleshoot and repair the Monarch® Sierra Sport2™ 9460™ printer.

- Chapter 1 contains general information and installation procedures.
- Chapter 2 contains physical and functional descriptions of major components.
- Chapter 3 contains procedures to perform troubleshooting beyond the capabilities of built-in diagnostics.
- Chapter 4 contains procedures to run built-in diagnostics for initial fault detection.
- Chapter 5 describes printer tests and adjustments.
- Chapter 6 contains step-by-step procedures to remove and replace failed assemblies and modules.
- Chapter 7 describes diagnostics available with the Monarch® MPCL™ Toolbox software.

Additional maintenance assistance is available in Appendix A, Error Codes; Appendix B, Care & Maintenance; Appendix C, Circuit Card Assembly Layouts.

The 9460 Illustrated Parts Breakdown contains additional information for replacing individual parts.

ELECTROSTATIC DISCHARGE

The 9460 printer contains devices that are sensitive to electrostatic discharge (ESD). It is essential that you follow proper ESD procedures. Use the Monarch-approved ESD Field Service Kit. Failure to provide proper static grounding can damage the printer components.

PUBLICATIONS

Field service technicians should be familiar with the documentation shown in the following table.

Table 1-1. Related Publications.

Title	Publication Number
Operator's Handbook	TC9460OH
1-Station Battery Charger Operating Instructions	TC9461OI
AC Adapter Instructions	TC9463OI
4-Station Battery Charger Operating Instructions	TC9464OI
Installing a Linerless Platen Roller	TC9460ACPROI
Carrying Your 9460 Printer	TC9460ACHPOI
Programmer's Manual (placed on Web site)	TC9460PM
RCL Programmer's Manual (placed on Web site)	TC9460RCL

EQUIPMENT DESCRIPTION

The 9460 printer is portable, and can print an image that is 1.89 inches wide on supplies up to 2.05 inches wide. Options include RF and IrDA communications, 1- and 4-station battery chargers, on-demand printing, an AC adapter, linerless printing, shoulder strap, hand strap, hip strap, and a belt clip that comes individually or with the hip strap.

The display is graphical. The keyboard has 5 keys-power, feed, and three that are context-sensitive (They have different functions according to the selected menu option.)

The standard memory configuration consists of 1 MB of Flash and 512K of static Random Access Memory (RAM).

The printer uses thermal direct printing to print on supplies listed in Table 1-2.

The printer operates in continuous or optionally, on-demand modes.

In continuous (non-peel) mode, the entire batch job is printed and fed in one continuous operation. The supply and liner (if used) are fed out together. Linerless models are also available but must use the special linerless platen roller.

In on-demand (peel) mode, the on-demand sensor detects the removal of a label, and the printer prints and feeds the next label. In on-demand mode, the label is separated (peeled) from the supply liner.

9460 printers have seven major elements:

- Front Case Assembly
- Battery Pack
- Print Module Assembly
- Back Inner Case Assembly
- Main PCB Assembly
- Keyboard/Display Assembly
- Back Outer Case Assembly
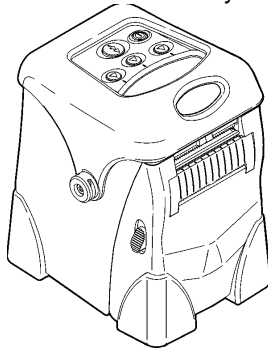
Figure 1-1.   9460 printer.

Chapter 2 contains a physical and functional description of each element.

EQUIPMENT SPECIFICATIONS

Bar Codes

The printer prints the following bar codes:

Linear Bar Codes

UPCA	UPCA+2
UPCE	UPCA+5
EAN8	UPCA+Price CD
EAN13	UPCE+2
POSTNET	UPCE+5
I 2 of 5	EAN8+2
I 2 of 5 with Barrier Bar	EAN8+5
Extended Code 39	EAN13+2
Codabar (NW7)	EAN13+5
Code 128	EAN13+Price CD
Code 93	MSI

2-D Stacked Bar Codes

Code 16K	PDF 417
Maxicode	Data Matrix

Additional Specifications

Specifications for the 9460 printer and its supplies are shown below.

Table 1-2.   Specifications

Feature	Specification
Shipping Weight	3.1 lbs. (1.4 kg)
Battery Pack	7.4V Lithium Ion
Chargers	15 VDC at 5 A (1-Station) or 24 VDC at 4.5 A 8 VDC at 5 A (4-Station)
Operating Limits	40°F to 104°F (4°C to 40°C)
Relative Humidity	5% to 90 % Non-condensing
Display	Multi-line, graphical LCD with backlight and adjustable contrast
Keyboard	5 keys (power, feed, and three context-sensitive)
Printhead	1.89 inches/48 mm/384 dots wide; (203 dots per inch; 8 dots per mm)
Printing Method	Thermal Direct
Print Speed	Up to 3 inches (76 mm) per second
Maximum Print Area	22.68 square inches (146 sq cm)
Maximum Print Image Width	1.89 inches (48 mm)
Maximum Print Image Length	12 inches (305 mm)
Stock:	
Supply Types	Tags, labels, and receipt paper (paper and synthetic).
Width	.5" (13 mm) to 2.05" (52 mm)
Length	Min. 0.5 inch (13 mm) Max. 12 inches (305 mm)
Supply Thickness	.0024 inches to .007 inches
Roll Diameter	Maximum roll OD: 2.5" (64 mm) Minimum core ID: 1.02" (26 mm)

INSTALLATION AND CHECKOUT PROCEDURES

1. Clear a work area approximately two feet wide.

2. Carefully open shipping carton.

3. Remove documentation.

4. Remove large cardboard insert.

5. Remove smaller cardboard insert.

6. Remove battery pack.

7. Place packing materials back in the carton and store carton.

8. Inspect printer for damage. Report damage using established procedures.

9. Insert the battery pack into the printer if charging through the printer charger adapter. Otherwise, remove the battery pack from the printer and insert into the battery charger adapter.

10. Charge the battery (approximately 2 hours for full charge).

Printer Checkout

1. Turn printer on by pressing the power button.

2. Check printer display for error indications.

3. Push down on the locking tabs to install supplies.

4. Print a test label. Use instructions in Chapter 4.

5. Review setup instructions with operator. Refer to *9460 Operator's Handbook* (TC9460OH).

6. Connect communications cable as shown. Ensure the cable is pushed inward as the door is tightened down to provide strain relief.
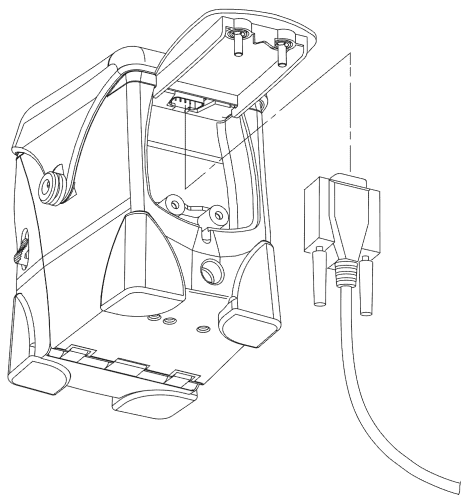
Figure 1-2.   Connecting Communications Cable.

Communications Interface

The printer's asynchronous RS-232 port is a DB9 connector located on the inside of the back outer case.

The following parameters are software selectable. The defaults are listed in bold.

- Baud rate: 1200, 2400, 4800, **9600**, 19200, or 38400, 57600, 115.2K

- Parity: Odd, Even, or **None**

- Stop Bits: **1** or 2

- Data Bits: 7 or **8**-bit

- Flow Control: **XON/XOFF**, RTS, or DTR

Following are the pinouts and signals of the DB9 connector.
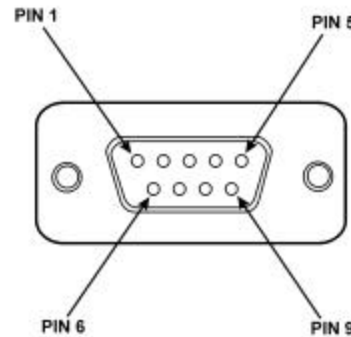
Figure 1-3.   RS-232 Serial Port Connector Pinouts.

ANSI/EIA-232-D		
Contact #	**Circuit**	**Description**
8	CTS	Clear to Send
7	RTS	Request to Send
3	TXD	Transmitted Data
5	GND	Signal Ground
2	RXD	Received Data
4	DTR	Data Terminal Ready
6	DSR	Data Set Ready
1	---	Reserved – Do not connect
9	---	N/C

The following cables are available to connect the 9460 printer to other devices.

Cable Number	Type
12029306	Symbol 3800 LRT/LDT
12029309	Telxon 960
12029314	DB9 to DB9 female serial port
12029315	DB9 to DB25 female serial port
12029316	Symbol PDT 3100
12029323	Unterminated locking
12029343	Telxon 960SL
12029344	Symbol PDT 6100
12029345	Symbol SPT 1500
12029346	Symbol SPT 1700
12029347	Symbol SPT 2700

CHAPTER 2. PHYSICAL/FUNCTIONAL DESCRIPTION

This chapter contains a physical and functional description of the 9460 printer modules shown below.

- Front Case Assembly
- Battery Pack
- Print Module Assembly
- Back Inner Case Assembly

- Main PCB Assembly
- Keyboard/Display Assembly
- Back Outer Case Assembly

Boot

Case Top

Display Lens Assembly

Display PCB Assembly

Keyboard

Printer Contact

Main PCB Assembly

Back Inner Case

Print Module Assembly

Back Outer Case

Front Case Assembly

Foot

Battery Pack
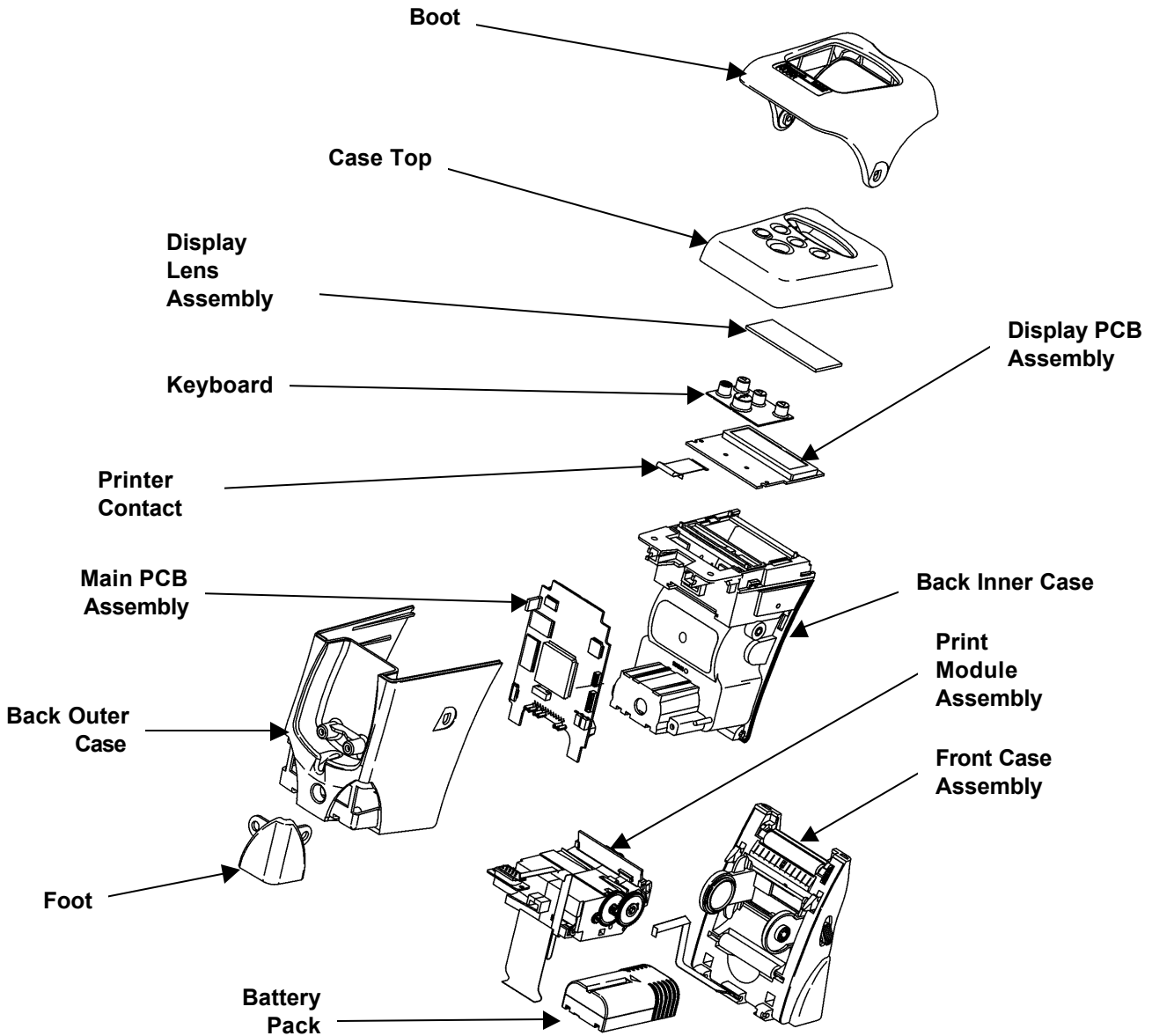
Figure 2-1.   Printer Main Assembly.

Roller

Peel Door

Compression
Spring

Front Flex
Assembly

RF PCB

Supply Holder
Assembly
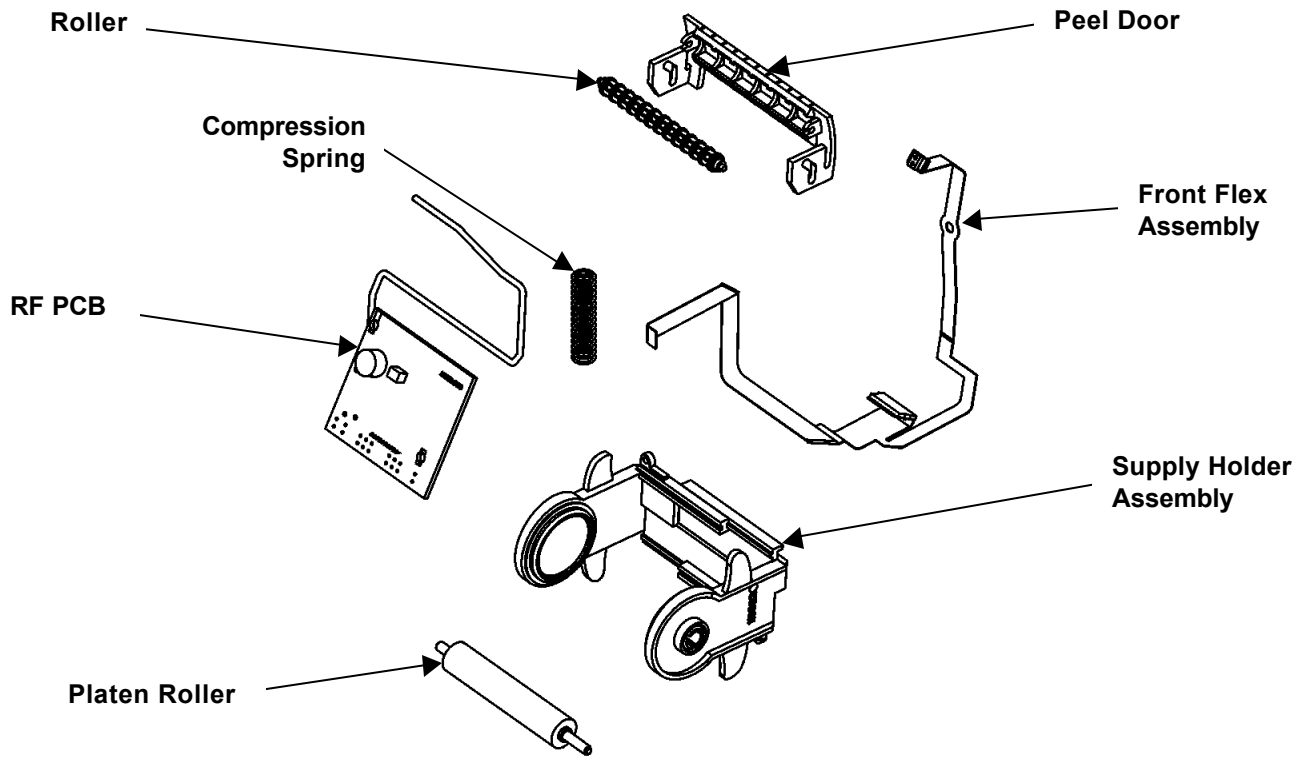
Platen Roller

Figure 2-2.   Front Case Assembly.

FRONT CASE ASSEMBLY 11998901/03

The Front Case Assembly will be stocked for service replacement. It contains:

- Platen Roller Assembly
- Supply Holder Assembly
- Latch Springs
- Peel Roller Assembly
- Front Flex Assembly

- RF PCB Assemblies (if ordered as an option-11998903)

Platen Roller Assembly

The 119951 Platen Roller Assembly provides drive for feeding the supplies by causing friction against the backside of the supplies. It is considered an operator-replaceable item.

A linerless platen roller 119952 is available as an option and can be easily identified by its burnt orange color.

Supply Holder Side

Idler Gear

Extension Spring

Supply Holder Side

Supply Hubs
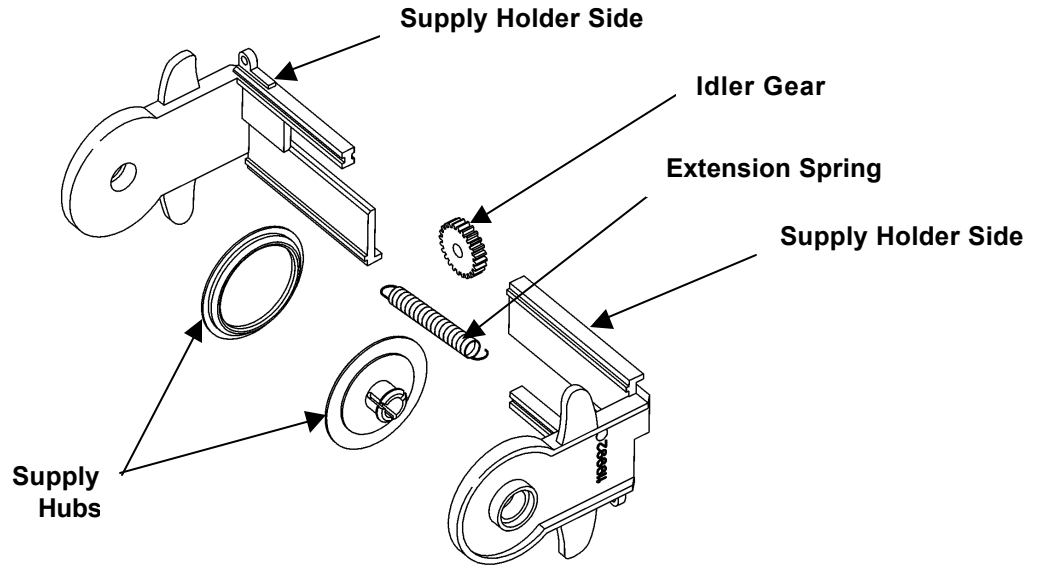
Figure 2-3. Supply Holder Assembly.

Supply Holder Assembly 119991

The Supply Holder Assembly is made up of a molded part that has a gear rack and provisions for a single spring on the underside. The design is such that two of these parts interlock and slide so that any supply roll width between 12.7 (.50") and 50.8(2.00") can be accommodated. A small pinion gear is mounted on a post on the inside of the front outer case so that it coordinates the motion of the two parts. This action ensures that the supply will be center-justified within the printer.

The label path is such that the face side of the supplies is wound outside. A roller that is mounted on the bottom of the Print Module Assembly bends the supply back and supports it to reduce friction or drag against the face side of the supply.

Latch Springs

The latch springs lock the Front Case Assembly in the closed position ensuring that the relationship between the platen and the printhead dot row is maintained. The U-shaped latch is mounted between the inner and outer front case parts and is urged upward by a pair of compression springs that provide about 1 pound of force each. Features on the latch project out of the sides of the door so that the user can pull the latch down to open the unit.

Peel Roller Assembly

The peel mechanism is made up of a formed sheet metal peel edge, a peel roller 116951 and a peel door 119966. The peel edge is mounted in features in the front inner case and extends from one side of the unit to the other. The peel edge is formed into an acute angle of about 40° with a radius of 0.65 (0.025") over which the liner passes when the supply is loaded in peel mode. The peel door is a molded part that supports the pressure roller and has a dogleg cam track on each end in tabs that project out of the main shape at a right angle.

During operation, pin-shaped projections on the latch engage the cam tracks such that the peel roller is forced against the Platen Roller Assembly. This action pinches the release liner, forcing it to follow the peel edge and provide the necessary direction change of the liner that creates the peeling function.

Front Flex Assembly 119995

The Front Flex Assembly contains the black mark sensor and RF connector. When black mark sensing is selected, the start-of-label position synchronization for each label is accomplished through the use of the reflective optical sensor (black mark sensor). The black-mark sensor detects a black mark pre-printed on the back of the supply and the die cut sensor detects the change in the amount of light passed through the label liner. The sensors are used to control the start-of-print position. A proprietary scheme is used to automatically compensate for differences in sensor sensitivity as well as for variations in supply and black mark reflectivity.

RF PCB Assembly 118752

The RF PCB is mounted within the lower portion of the Front Case Assembly on projections formed on the inside of the front outer case. It is secured in place during assembly by small plastic retainers that are pressed on the projections. The antenna is wound up toward the top of the door. This arrangement permits the RF link to communicate with the host from a distance of up to 3 meters (9.8 feet).

BATTERY PACK 120095

The printer is powered by a 2 high-capacity Lithium Ion cells inside a battery pack for a combined output of 7.4 VDC at 1.6 AH. A pocket is provided in the back inner housing that is shaped such that the battery pack nests within it and cannot be inserted except in the correct orientation. The battery inserts into the pocket from the front when the Front Case Assembly is open with its long direction oriented front to back. The pocket is located near the bottom of the unit and is somewhat straddled by the CPU board.

The battery pack is a disposable item and cannot be repaired. It contains protection circuitry in the case of a malfunction. With its capacity, it is designed to print up to 5500 inches before recharging. Unlike other battery technologies, recharging a partially used Lithium Ion battery pack will not reduce its cycle life or cause limited capacity through memory.

It can be removed for charging. Or, while in the printer, it can be charged through contacts that are located on the printer base. To do so, the printer is inserted into the printer adapter 120291. The M09461 Single Station Charger will accommodate one battery for charging and is a stand-alone charger. The M09463 Four Station Charger Base must be used with the 120290 battery adapter or 120291 printer adapter. Because the base has four stations, the following combinations of adapters can be used: four 120290 battery adapters or two 120291 printer adapters and two 120290 battery adapters.
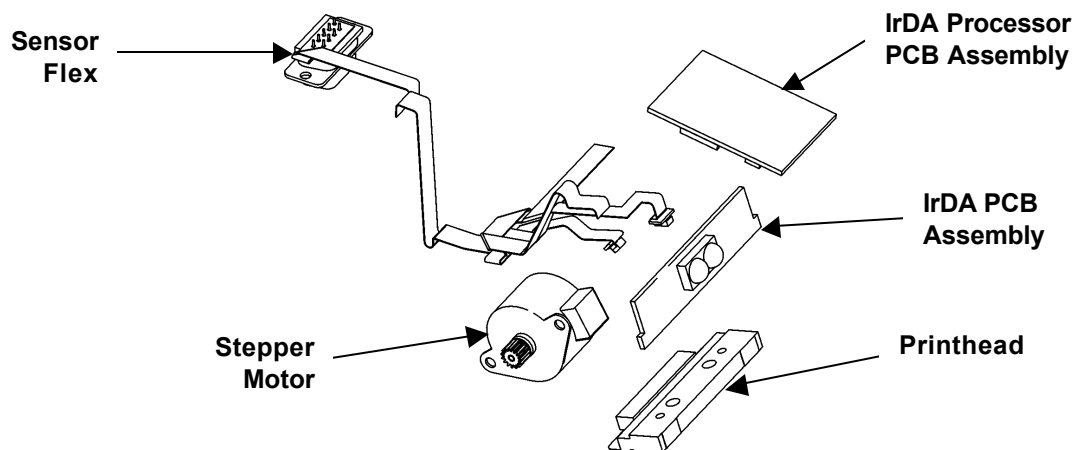
Figure 2-4.   Print Module Assembly.

PRINT MODULE ASSEMBLY 11997501/02

The Print Module contains:

- Sensor Flex Assembly
- Printhead Assembly
- Stepper Motor
- IrDA Processor Assembly (if ordered as an option-11997502)

Sensor Flex Assembly 119988

The Sensor Flex Assembly contains the on-demand sensor, die Cut sensor, DB9 and IrDA port connectors.

The on-demand sensor is a dual device that operates as a retro-reflector. It is mounted in the Print Module Assembly so that it looks down on the supply as it exits from the printhead.

The die cut sensor uses the black mark sensor receiver and an overhead LED to flood the supply with IR light. When die cut sensing is selected, the start-of-label position synchronization for each label is accomplished through the use of a transmissive die cut sensor located in the Sensor Flex Assembly. The die cut sensor detects the change in the amount of light passed through the label liner. The sensors are used to control the start-of-print position. A proprietary scheme is used to automatically compensate for differences in sensor sensitivity as well as for variations in supply and liner opacity.

Printhead Assembly 119990

The M09460 printhead is a non-intelligent printhead designed for thermal direct printing. The size, weight, and physical dimensions of this head are proportionate with the 2" maximum supply width. Dot-history control is accomplished with external electronics and the 68336 micro controller. The M09460 printhead has a 1.89" length print line, comprised of a linear array of 384 dots with 203 dots per inch. Each dot is spaced at .0049 inches. The electrical interface to the printhead is through the 68336 micro controller and the PLD.

Stepper Motor 119980

The M09460 supply feed is accomplished by means of a stepper motor driving an elastomeric drive roller through a gear train. This drive roller is the platen roller for the printhead. The actual drive is a friction drive on the liner or backside of the supply, which is pinched between the platen roller and the printhead.

The M09460 stepper motor is not more than 25mm in diameter. The Motorola 68336 TPU, interfaced with electronic power drivers, controls the motor. The motor is turned on and off dynamically as required.

The label speeds are 1.5 IPS, 2.0 IPS, and 3.0 IPS. The operator can choose 1.5 IPS. Otherwise, the printer will automatically select the fastest print speed based upon several conditions. The two biggest factors in determining the print speed are the battery voltage and the format size. Other factors used to select the speed are the printhead temperature, the printhead resistance, and the type of data to be printed. A format containing a serial bar code, graphics and/or lines may be printed at a slower speed than a format with only text and a parallel bar code. There may be some cases where a 2-inch wide format will not print at 3.0 IPS even with a fully charged battery.

The M09460 will run at a continuous speed through a printed label (i.e. it will not change speeds during the printing of a label or continuous strip of labels). The uniformity of the motion is sufficient to permit printing of parallel bar codes of ANSI grade B minimum and serial bar codes of ANSI grade C minimum on approved label and tag stocks. The quality of bar codes printed on fax paper is not guaranteed (only human-readable).

IrDA Processor Assembly

Two PCB's that are mounted in the Print Module provide the IrDA option. The 119985 IrDA PCB mounts the active infrared device, located on the top front of the Print Module above the printhead. The second PCB is the IrDA Processor PCB 120280, mounted at the top of the carrier housing.

BACK INNER CASE ASSEMBLY 119961S

The Back Inner Case Assembly is made of glass-reinforced nylon and is the central support for all mechanical and electrical sub-assemblies in the printer. It contains the pocket for the battery, as well as mounting for the serial label, Print Module Assembly, Main PCB Assembly, Keyboard/Display Assembly and Back Outer Case Assembly.

MAIN PCB ASSEMBLY 119810

The Main PCB Assembly contains the micro controller, RAM, flash memory, reset circuitry, and the associated electrical components. The system is designed with minimum connections in the signal lines between these basic parts, which form the heart of the system.

The micro controller used in the M09460 is a Motorola MC68336GCFT20 micro controller operating at 18.35 MHz. This processor is a CPU32 micro controller plus the additional TPU micro controller. The 68336 micro controller has a 16 MB addressing range. The 68336 has on board port lines, A/D converter, timers, power management, and a serial port, providing all the needed resources on a single chip.

KEYBOARD/DISPLAY ASSEMBLY

The Keyboard/Display Assembly must be ordered by its individual components. It is made up of the display flex 120006, keyboard/display PCB 119956, keyboard 119953, display lens 119968, top case 119962, and boot 11997206/08/09.

The display is used to indicate the status of the printer. If the printer is in diagnostics mode, the display is used to lead the operator through diagnostics menus and display the results of the diagnostics test. The bottom portion of the display is also used to dynamically change the functions of the three context-sensitive keys. Because the display is used differently for each function of the printer, please refer to the *Operator's Handbook* for a complete description of the display interface.

The keyboard/display PCB has a graphic display and switch traces on its top surface. The key portion of the design is made up of a molded elastomeric material with conductive sections placed in the center of the formed keys. The board traces are designed and positioned under the keyboard so that when a key is pressed and held, the switch circuit is made.

The keyboard has five keys: power, feed and the three context-sensitive keys. The power key must be held down for approximately one second to turn the printer on or off. The feed key has two basic functions: feed to top-of-form and as an escape key when in Diagnostics or Configuration mode. The context-sensitive keys are used for printer control, configuration and diagnostics. The keys are used differently, depending on the mode the printer is in. Refer to the *Operator's Handbook* for more information on the use of these keys.

BACK OUTER CASE ASSEMBLY 119960S

The Back Outer Case Assembly provides access to the DB9 serial port through the 119965 door that has locking slotted screws. It is designed to provide strain relief to ensure a solid cable connection. Also on this assembly are two of the four 119970 feet used for shock resistance and stability.

CHAPTER 3. TROUBLESHOOTING

Troubleshooting the 9460 printer is accomplished through messages displayed by the printer, built-in test diagnostics, and manual troubleshooting. Certain errors are identified by error codes. Error codes and hardware failure messages are listed in Appendix A.

Before troubleshooting, always fully charge the battery. Using a discharged battery pack can give false failure indications.

The information in this chapter assists in identifying and/or confirming the failure of a replaceable module. Troubleshooting is presented in an "ease of checking", "most likely to fail--least likely to fail" order. If the replacement of the indicated modules does not repair the printer, contact Technical Support for additional assistance.

GENERAL PRINT QUALITY COMPLAINTS

1. Ensure Front Case Assembly is fully closed and latched.
2. Ensure supply type and contrast are properly set.
3. Print a diagnostics test pattern. Adjust the printer as necessary.
4. Verify platen bearings are locked into position.

PRINTS LIGHT IMAGE ACROSS ENTIRE SUPPLY

1. Replace battery pack with a fully charged unit.
2. Use Setup to verify proper contrast and supply settings.
3. Verify platen bearings are locked into position.
4. Inspect printhead and platen roller for debris or damage. Clean as necessary
5. Print a diagnostics test pattern. Adjust printhead as necessary.
6. Replace supply and retest printing.
7. Replace Print Module Assembly and retest.
8. Check Printhead Flex Assembly. Reseat as necessary.
9. Replace Platen Roller Assembly and retest.
10. Replace Main PCB Assembly.

PRINTS LIGHT IMAGE ON ONE SIDE OF SUPPLY ONLY

1. Ensure Front Case Assembly is fully closed and latched.
2. Verify platen bearings are locked into position.
3. Inspect printhead and platen roller for debris or damage. Clean as necessary.
4. Print a diagnostics test pattern. Adjust printhead as necessary.
5. Replace Print Module Assembly and retest.
6. Replace Platen Roller Assembly and retest.
7. Replace Main PCB Assembly.

PRINTS VOIDS ACROSS PRINT AREA

1. Inspect and clean printhead and platen.
2. Use diagnostics to check for proper contrast and supply settings.
3. Verify platen bearings are locked into position.
4. Use diagnostics to print test pattern. If voids are visible and platen rollers are serviceable, problem may be in the supply.
5. Change supply and retest.

PRINT IMAGE MISSING DOTS, CREATING A WHITE LINE THROUGH IMAGE AREA

1. Inspect and clean printhead and platen.
2. Use diagnostics to check printhead.
3. Use diagnostics to print test pattern. If white line is still visible, replace Print Module Assembly.
4. Ensure printhead flex is properly seated.
5. Replace Main PCB Assembly.

PRINTS COMPRESSED IMAGE

1. Inspect and clean paper path and reload supply.
2. Verify platen bearings are locked into position.
3. Replace Print Module Assembly.
4. Replace the Main PCB Assembly.

PRINTER DOES NOT FEED

1. Check battery pack. Recharge or replace as necessary.
2. Check feed path. Clear/clean as necessary.
3. Ensure Front Case Assembly is closed and latched.
4. Verify platen bearings are locked into position.
5. If printer still does not feed, replace Print Module Assembly.

PRINTER SKIPS LABELS

1. Check to ensure printer supply type is correct for format.
2. Run diagnostics calibration test.
3. If sensor does not adjust:
   a. Check sensor and/or Front Flex Assembly connections.
   b. Replace Print Module Assembly or Front Case Assembly as applicable.

NO DISPLAY AT POWER UP

1. Check battery pack. Charge/replace as necessary.
2. Replace the following items one at a time and retest:
   - Display/Keyboard PCB Assembly
   - Print Module Assembly
   - Front Case Assembly.
3. If there is a partial or light display, check display by going to Diagnostics, Display then Pixel.
4. Adjust display contrast as necessary through Setup, LCD Contrast.
5. Replace Display/Keyboard PCB Assembly.

INCORRECT OR NO RESPONSE WHEN KEY IS PRESSED

1. Run diagnostics keyboard test. If one key fails, replace Keyboard Assembly and retest.
2. If test fails, replace Keyboard/Display Assembly.
3. If still no response, replace Display Flex Assembly.
4. Replace Main PCB Assembly.

NO COMMUNICATIONS BETWEEN PRINTER AND HOST

1. Run diagnostics serial port test. If printer fails test, replace Print Module Assembly.
2. If printer passes loopback test, check/replace data cable.
3. If communication is still not possible, the problem is in the computer/host port or the data.

Note: Jumper JP1 must be set to pins 2 and 3 to properly communicate with a Symbol terminal. You must visually check that the jumper is on the top two pins.

BATTERY CONDITION CHECK

1. A fully charged battery pack should show as close to the full designator on the display as possible upon power up of the printer.

2. To verify exact voltage reading, go to Diagnostics, Printer, then Battery. Readings greater than 8.2 indicate a fully charged battery pack. Readings less than 7.3 will indicate that the printer is close to indicating a low battery condition.

PRINTER SHUTS COMPLETELY OFF WHILE PRINTING

The printer was printing more than the maximum black allowable on a format.

1. Reset the printer.

2. Alter the format so there is less black printing on the format.

CHAPTER 4. DIAGNOSTICS

OVERVIEW

The 9460 printer has a diagnostics utility in flash memory when it is shipped from the factory. It tests the capabilities, features, and functions (hardware and software) of the printer. Customers can use it before calling Service to obtain diagnostics data that gives an indication of the problem. Service personnel can also use it for other tests.

Use diagnostics to

- determine printer configuration.
- perform hardware tests.
- perform service diagnostics.

There is also a Diagnostics Utility (only available to Service Technicians), which is part of the MPCL Toolbox.

POWER-UP DIAGNOSTICS

The M09460 performs a power-on self-test before entering normal operation. This test includes, but is not restricted to, a RAM test, printhead test, and battery check.

RAM Test

The RAM test consists of four loops of writing to memory. Loop one writes a 0x00 pattern to all of RAM. Loop two verifies the 0x00 pattern while writing a 0x55 pattern. Loop three verifies the 0x55 pattern while writing a 0xAA pattern. Loop four verifies the 0xAA pattern while writing 0xFF to clear RAM for power-up.

Error 900 occurs if this test fails, and the printer will no longer respond to communications or keypad entry.

Printhead Test

Checks the individual dot element resistance and the average resistance. If any individual dots test out of the allowable range, they will be marked as bad. If more than 10 dots are bad, error 768 occurs. The user can clear the error, but they cannot print. If 10 or fewer dots are bad, no error occurs.

If a bar code cannot be positioned correctly for printing, error 616 occurs.

Battery Check

If the battery voltage is less than 7.3 volts, a low battery indication will be displayed causing no printer operation until the battery is recharged.

USER DIAGNOSTICS

Table 4-1. 9460 Printer Menu Structure.

Main Menu	Sub Menu	Sub Menu	Sub Menu
Diagnostics	Printer	Test Label	Diag Label Test Pattern Grey Scale Exit
		Sensors	Black Mark Die Cut On-Demand Exit
		Printhead	Dot Test Dot Resist. Temperature Exit
		Battery	
		View Totals	Print Inch Service Inch Prt High In. Ser High In. Exit
		Exit	
	Display	Backlight Pixel Exit	
	Keyboard Comm. RAM About Exit		
Online Diag	Enable Disable Exit		

Continued on the next page

Setup	Stock		
	Energy	Standard	
		Special	
		High	
		Energy	
		Exit	
	Backlight	Disable	
		Enable	
		Exit	
	LCD		
	Contrast		
	Printer	Contrast	
		Supply Pos	
		Print Pos	
		Margin Adj	
		Demand	
		Sensor	Disable
			Enable
			Exit
		Stock	
		Sensor	
		Exit	
	Serial		
	Comm.	Baud Rate	
		Parity	
		Data Bits	
		Stop Bits	
		Flow Ctrl	
		Exit	
	Power		
	Mgmt.	Disable	
		10 seconds	
		20 seconds	
		30 seconds	
		1 minute	
		2 minutes	
		5 minutes	
		10 minutes	
		30 minutes	
		1 hour	
		Exit	
	Exit		
Service	Totals	View	
		Modify	
		Clear	
		Exit	
	Sensor Cal	Die Cut	
		Black Mark	
		On-	
		Demand	
		Exit	
	Virgin		
	Reset		
	Boot		
	Loader		
	Exit		
Exit			

Password Entry

To enter the online menu system, you must enter a password. It is **Left** Ⓐ/**Left** Ⓐ/**Left** Ⓐ/**Right** Ⓐ/**Left** Ⓐ. The Main Printer menu appears.

Diagnostics

Displays the Main Diagnostics menu.

<u>Printer</u>

Displays the Printer Diagnostics menu.

Test Label

Displays the Test Label menu.

- Diag Label
  Prints a diagnostics label.

- Test Pattern
  Prints a test pattern.

- Grey Scale
  Prints a grey scale.

- Exit
  Returns to the Printer Diagnostics menu

Sensors

Displays the Sensor Diagnostics menu.

- Black Mark
  Displays the Black Mark sensor A/D value.

- Die Cut
  Displays the Die Cut sensor A/D value.

- On-Demand
  Displays the On-Demand sensor A/D value.

- Exit
  Returns to the Printer Diagnostics menu.

Printhead

Displays the Printhead Diagnostics menu.

- Dot Test
  Runs the Printer Dot test and displays the results.

- Dot Resist.
  Displays the average dot resistance in ohms.

- Temperature
  Displays the printhead temperature.

- Exit
  Returns to the Printer Diagnostics menu.

Battery

Displays the battery voltage in volts.

View Totals

Displays the printer inches, the service inches, the printer high inches, and the service high inches.

Exit

Returns to the Main Diagnostics menu.

Display

Displays the Display Diagnostics menu.

- Backlight
  Turns the backlight on and off (even if the backlight is disabled).

- Pixel
  Turns all display pixels on and off.

- Exit
  Returns to the Main Diagnostics menu.

Keyboard

Runs the keyboard test.

Comm.

Prompts the user to install the loopback plug and runs the diagnostics. It tests all supported baud rates, and checks the parity and control lines.

Before running this test, take the top of the printer off and remove the +5 volt jumper. The test fails with the jumper on.

RAM

Runs the RAM diagnostics.

About

Displays the application and hardware versions.

Exit

Returns to the Main Printer menu.

Online Diagnostics

Sets access to online diagnostics.

- Enable
  Enables access to online diagnostics.

- Disable
  Disables access to online diagnostics.

- Exit
  Returns to the Main Printer menu.

Setup

Displays the Setup Main menu.

Stock Energy

Sets the type of supply being used.

- Standard
  Standard supplies are being used.

- High Energy
  Synthetic or linerless supplies are being used.

- Exit
  Returns to the Setup Main menu.

Backlight

Enables or disables the backlight.

- Enable
  Turns the backlight on.

- Disable
  Turns the backlight off.

- Exit
  Returns to the Setup Main menu.

LCD Contrast

Sets the contrast of the display.

Printer

Displays the Printer Setup menu.

- Contrast
  Adjusts the print contrast.

- Supply Pos
  Adjusts the supply position.

- Print Pos
  Adjusts the print position.

- Margin Adj
  Adjusts the margin position.

- Demand Sensor
  Enables or disables the on-demand sensor.

- Stock Sensor
  Changes the sensor type and automatically enters into the calibration routine for that sensor.

- Exit
  Returns to the Setup Main menu.

Serial Comm.

Displays the Serial Communications Setup menu.

- Baud Rate
  Selects the baud rate.

- Parity
  Selects the parity.

- Data Bits
  Selects the number of data bits.

- Stop Bits
  Selects the number of stop bits.

- Flow Control
  Selects the flow control.

- Exit
  Returns to the Setup Main menu.

Power Mgmt.

- Disable
  Disables power management.

- 10 sec. – 1 hour
  Selects the timeout by selecting one of the values ranging from 10 seconds to 1 hour.

- Exit
  Returns to the Setup Main menu.

Exit

Returns to the Main Printer menu.

Service Diagnostics

Prompts the user for a password and starts the service diagnostics. The password is **Right** Ⓐ/**Center** Ⓐ/**Left** Ⓐ/**Center** Ⓐ /**Right** Ⓐ. The Service Main menu appears.

Totals

Displays the Totals menu.

- View
  Displays the number of inches moved in the printer, including forward and backwards motion. Both print inch (total inches) and service inch totals can be viewed.

- Modify
  Allows the service technician to modify the print inch and service inch totals.

- Clear
  Allows the service technician to clear both the print inch and/or service inch totals.

- Exit
  Returns to the Service Main menu.

Sensor Cal

Allows the service technician to select a sensor to perform a sensor calibration with installed supplies. When the sensor type is changed in the Setup Main menu, the sensor calibration routine is automatically accessed to ensure accurate supply feeding.

Virgin Reset

Resets the printer to the state in which the customer received it.

Boot Loader

Places the printer into boot loader mode.

Exit

Returns to the Main Printer menu.

Exit

Returns to the Ready prompt.

MONARCH INITIALIZATION FILES (.MIF)

.MIF files specify parameters for the printer. They provide a quick and easy way to alter certain aspects of the printer's activity from the system defaults.

To load a .MIF file, use the Monarch Flash Utility, and then reboot the printer. To change the parameters, reflash the printer with a new .MIF file. To return the printer to the system defaults, do a virgin reset.

To create a .MIF file, use any text editor, such as Microsoft® Windows® Notepad. Following is an example:

[MONARCH M9460]

LOW_POWER = *time*

SUPPLY_POS = *rows*

FLOW = *flowvalue*

LEFT_OFFSET = *rows*

REFL_MIN = *value*

TRANS_MIN = *value*

REPRINT = *setting*

ON_DEMAND = *setting*

COM = *baud*, *parity*, *databits*, *stopbits*, *flowcontrol*

END

Note: The bold lines are required. The parameters can appear in any order.

Following are the parameters:

Parameter	Possible Values
LOW_POWER The time before the printer goes into sleep mode.	1 - 7200 seconds
SUPPLY_POS The amount of supply that feeds out of the printer.	-99 - 99 dot rows
FLOW Flow control.	0 None 11 DTR/DSR 12 RTS/CTS 21 XON/XOFF
LEFT_OFFSET How far from the left side of the supply that the printer can print (RCL only).	-99 – 99 dot rows
REFL_MIN The minimum reflectance A/D count to determine the black mark.	0 – 255

Parameter	Possible Values
TRANS_MIN The minimum transmissive A/D count to determine the black mark.	0 – 255
REPRINT Sets the ability for the printer to be able to reprint a batch.	0 Disabled 1 Enabled
ON_DEMAND Sets the hardware capability to use on demand printing.	0 Disabled 1 Enabled

COM
 The communication parameters to use. Values in bold are the defaults.
	baud
	    1200, 2400, 4800, **9600**, 19200, 38400, 57600, 115200
	 parity
	    N (None), E (Even), O (Odd)
	 databits
	    7, **8**, or 9
	 stopbits
	    1 or 2
	 flowcontrol
	    N (None), D (DTR/DSR), R (RTS/CTS), X (XON/XOFF)

PC DIAGNOSTICS

The Monarch MPCL Toolbox software includes more service diagnostics. See Chapter 7 for more information.

IMMEDIATE COMMANDS

There are two 9460 MPCL immediate commands for service use only, as follows.

Command	Description
^MF	Uploads the .MIF file from the printer to the host.

Command	Description
^MS	Uploads information about the flash file system contents from the printer to the host. For each file, it uploads the type, the file ID, and the file size. For example: FONT :1001 4016 FONT :1002 5040 FONT :1003 6720 FONT :1004 3808 FONT :1005 5216 FONT :1006 2880 FONT :1007 3984 FONT :1008 4800 FONT :1009 5840 FONT :1010 3648 FONT :1011 4976 FONT :1013 13440 FORMAT :1018 60 FORMAT :1019 60 FORMAT :1016 60 FORMAT :1015 60 MIF :-001 40 18 file(s) 68104 bytes 259514 free

CHAPTER 5. TESTS AND ADJUSTMENTS

Because of the complex test fixtures required to build the sub-assemblies in the printer, Service will replace by sub-assembly instead of by component. There are no mechanical or electrical adjustments that can be done in the field apart from what is available through the configuration packets in MPCL. These adjustments are available through the keyboard (refer to Chapter 4 for details) and through the MPCL Toolbox.

MAIN PCB ASSEMBLY

There are two potentiometers on the Main PCB and one jumper.

RV1

This potentiometer sets the +5 VDC A to D reference voltage and should NOT be adjusted in the field. It can be verified on pin 8 of D14.

RV2

This potentiometer controls the LCD Contrast. Adjust the LCD contrast through the Setup menu and NOT with this adjustment. (This adjustment will be removed at PCB level AG.)

JP1

This jumper is normally on pins 1 and 2 to allow for DTR flow control. If a printer will be cable connected to a Symbol terminal, this jumper must be set to pins 2 and 3. There is no way to sense this connection. Remove the Back Outer Case to verify the jumper connection.

Note: Pin 1 is the bottom pin, so for Symbol terminal connectivity, the jumper MUST be on the top two pins.

BATTERY TEST

You can check the battery by the built-in gauge on the display, through printer diagnostics, or the MPCL Toolbox.

To enter into MPCL Toolbox Diagnostics mode, you must enable online diagnostics on the printer and be at the Ready prompt.

A fully charged battery should be greater than 8.2 VDC, a battery requiring a charge should be less than 7.3. Any battery pack less than 6.8 VDC should be replaced.

SENSOR CALIBRATION

All three sensors should be calibrated through Service diagnostics (as described in Chapter 4) or MPCL Toolbox diagnostics.

To enter into MPCL Toolbox Diagnostics mode, you must enable online diagnostics on the printer and be at the Ready prompt.

Sensor	High	Low	Delta
Black Mark	>3.92 VDC (on white)	<2.94 VDC (on black)	1 VDC
Die Cut	>2.50 VDC (liner only)	<2.40 VDC (liner and supply)	1 VDC
On Demand			0.196 VDC

PRINTHEAD VERIFICATION

The printhead can be tested by printer diagnostics or MPCL Toolbox diagnostics.

To enter into MPCL Toolbox Diagnostics mode, enable online diagnostics on the printer and be at the Ready prompt.

Standard average resistance of the printhead is 350 ohms with an individual dot range of 245-455.

CHAPTER 6. DISASSEMBLY PROCEDURES

TOOLS REQUIRED

- 3/32 Allen wrench
- #1 Phillips screwdriver
- small straight slot screwdriver

REMOVING THE BOOT, 11997203/06/08

1. Remove the optional strap assembly, if present.
2. Remove 2 M4X16mm socket head cap screws securing the strap buttons, and remove the strap buttons.
3. Remove the boot.
4. Reassemble in reverse order.

REMOVING THE BACK OUTER CASE, 119960S

1. Remove the boot.
2. Remove the battery and supplies.
3. Unscrew the 2 captive M4X16mm slotted screws on the DB9 door.
4. Open the front case, and remove 2 #4X3/8" plastite screws (one on each side of the battery).
5. Slide a small, straight-slot screwdriver along the sides between the inner and outer casework and gently push inner case out to disengage tabs.
6. Pull the back outer case down from the top cover, and away to the rear.

Assembly Note

Slide the back outer case under the DB9 door, 119965 and case top, 119962 until the ribs on each side snap into the slots on the back inner case, 119960. Be careful not to pinch the Front Flex Assembly between the back inner and outer cases.

7. Reassemble in reverse order.

REMOVING THE DB9 DOOR

1. Remove the boot.
2. Remove the back outer case.
3. Carefully spread the pins on the DB9 door, and remove them from the slots in the Back Inner Case Assembly.
4. Reassemble in reverse order.

REMOVING THE CASE TOP

1. Remove the boot.
2. Remove the back outer case.
3. Remove the DB9 door.
4. Remove 2 #4X3/8" plastite screws securing the case top to the back inner case (on either side of the DB9 connector).
5. Unsnap the case top from the back inner case assembly. (4 places).
6. Reassemble in reverse order.

REMOVING THE KEYBOARD/DISPLAY ASSEMBLY

1. Remove the boot.
2. Remove the back outer case.
3. Remove the DB9 door.
4. Remove the case top.
5. Lift the Keyboard/Display Assembly from the 4 bosses, and unfold it upward to gain access to the Display Flex ZIF connector CN8. Disconnect the flex from the Keyboard/Display Assembly.
6. Reassemble in reverse order.

REMOVING THE CPU BOARD ASSEMBLY

1. Remove the boot.
2. Remove the back outer case.
3. Remove the DB9 door.
4. Remove the case top.
5. Remove the Keypad/Display Assembly.
6. Carefully slide the DB9 connector from the back inner case.
7. Disconnect the DB9/OD/die cut sensor split flex from the ZIF connector CN3, the stepper motor harness from CN2, and the RF link/black mark sensor flex from ZIF connector CN9.
8. Carefully pry the three contacts from the back inner case using a small flat blade screwdriver.
9. Lift the bottom of the CPU board with corner mounts off of the posts, and rotate it up while pulling the board free from the top corner mounts.
10. Disconnect the printhead flex from ZIF connector CN7.
11. Reassemble in reverse order.

REMOVING THE PRINT MODULE

1. Remove the boot.
2. Remove the back outer case.
3. Remove the DB9 door.
4. Remove the case top.
5. Remove the Keypad/Display Assembly.
6. Remove the CPU Board Assembly.
7. Remove the compression spring from the boss on the back inner case. Using a small screwdriver or spring hook, compress the spring from the top, and disengage it from the tabs on the back of the Print Module Assembly. Then, rotate it out. Be careful not to lose it.
8. Remove the hinge pin securing the Print Module Assembly to the back inner case.
9. Slide the Print Module Assembly out the front of the back inner case while carefully guiding the 2 flexes and the stepper motor harness through their respective slots in the back inner case.
10. Reassemble in reverse order. Be careful when threading the flexes and harness through the back inner case.

REMOVING THE FRONT CASE ASSEMBLY

1. Remove the boot.
2. Remove the back outer case.
3. Disconnect the RF link/black bark sensor flex from ZIF connector CN9, and remove the tape holding the flex to the back inner case.
4. Remove the hinge pin, and unlatch the Front Case Assembly.

Assembly Note

While holding the flex up against the bottom of the back inner case, align the holes of the Front Case Assembly and back inner case, and carefully install the hinge pin. When properly assembled, the flex will be between the hinge pin and the bottom of the back inner case.

5. Reassemble in reverse order.

RETROFITTING TO IrDA

1. Remove outer case.
2. Remove front case assembly
3. Remove PCB.
4. Remove top case assembly.
5. Remove print module.
6. Unsnap the two halves of the print module assembly and separate them, watching for the spring.
7. Gently snap the IRDA PCB assembly in half to separate the LED and processor assemblies.
8. Slide the LED connector leg of the flex through the right side slot of the casework.
9. Connect the processor leg of the flex to the PCB and curl up to slide into the casework.
10. Slide the printhead and tear bar in.
11. Carefully reposition all harnesses and the spring, and then slide the casework back together.
12. Attach the LED connector leg of the flex to the PCB and roll the LED PCB to fit into the slot on the top of the casework.
13. Re-assemble in reverse order.

CHAPTER 7. PC DIAGNOSTICS

The Printer Diagnostics utility is one of the components of the MONARCH MPCL Toolbox software. The Printer Diagnostics utility mimics the functionality available in the Manufacturing Sendfile program.

Using the Printer Diagnostics utility you can:

- download files to the printer.
- display MUX values.
- test the printhead.
- display service totals.
- display stock history.
- upload images.

The Printer Diagnostics utility uses the communication port settings last used by one of the other Toolbox utilities. If you need to change the Comm port, select the Comm port (COM1-COM4) from the drop-down list box. To start using the Printer Diagnostics utility, you must first detect the printer. See "Detecting the Printer."
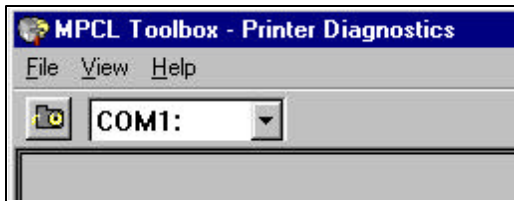
ENABLING ONLINE DIAGNOSTICS

To use the Printer Diagnostics utility, enable online diagnostics on the printer.

The default setting for online diagnostics is **disable**. To use these diagnostics, you must reset it to **enable** every time you turn on the printer. Follow these steps to enable online diagnostics.

1. Turn the printer **on** by pressing and holding down the power button until the display turns on.

    The display flashes printer version information and then you will see:

    ```
    Ready

    II
    ```
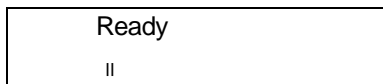
2. Press the Ⓐ button under the II icon. You will

    ```
    E ━━━━━━━━        F
      ▶              🚄
    ```

    see the battery indicator E (empty) and F (full).

3. Press the Ⓐ button under the toolbox icon to enter diagnostics. You will see:

    ```
    Diagnostics
    Online Diag.
    ↵              ▼
    ```
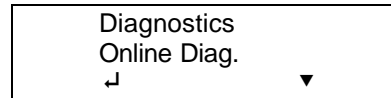
4. Scroll until Online Diag. is highlighted. Select Online Diag. You will see:

    ```
    Enable
    Disable
    ↵              ▼
    ```
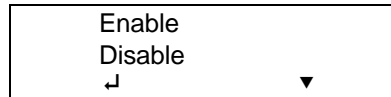
5. Select Enable. You will see:

    ```
    Online Diag
    Enabled
    ↵              x
    ```
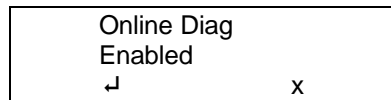
    The online diagnostics are turned **on**.

6. Press the Ⓐ button under the x icon or press the ⓕ button to exit.

To disable online diagnostics:

1. From the Online Diagnostics menu, select Disable. You will see:

    ```
    Online Diag
    Disabled
                   x
    ```
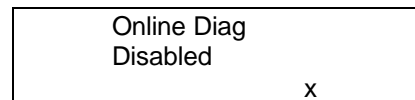
    The online diagnostics is turned **off**.

2. Press the Ⓐ button under the x icon or press the ⓕ button to exit.

DETECTING THE PRINTER

Click Detect Printer to sense which printer is connected and start using the utility. The model

being tested and the software version number displays.

```
MPCL Toolbox - Printer Diagnostics                    _ □ ×
File  View  Help

[🖳] COM1:        ▼

       ┌─ Printer Information ──────────┐
       │                                │    ┌──────────────────────┐
       │  M9840                         │    │   Display MUX Values  │
       │                                │    └──────────────────────┘
       │  Version 6.5                   │    ┌──────────────────────┐
       │                                │    │   Test Print Head     │
       │  M9840                         │    └──────────────────────┘
       │  256K RAM Memory               │    ┌──────────────────────┐
       │                                │    │   Display Totals      │
       │                                │    └──────────────────────┘
       │                                │    ┌──────────────────────┐
       │        [ Detect Printer ]      │    │   Display Stock History│
       │                                │    └──────────────────────┘
       └────────────────────────────────┘    ┌──────────────────────┐
                                              │   Upload Image        │
                                              └──────────────────────┘
```
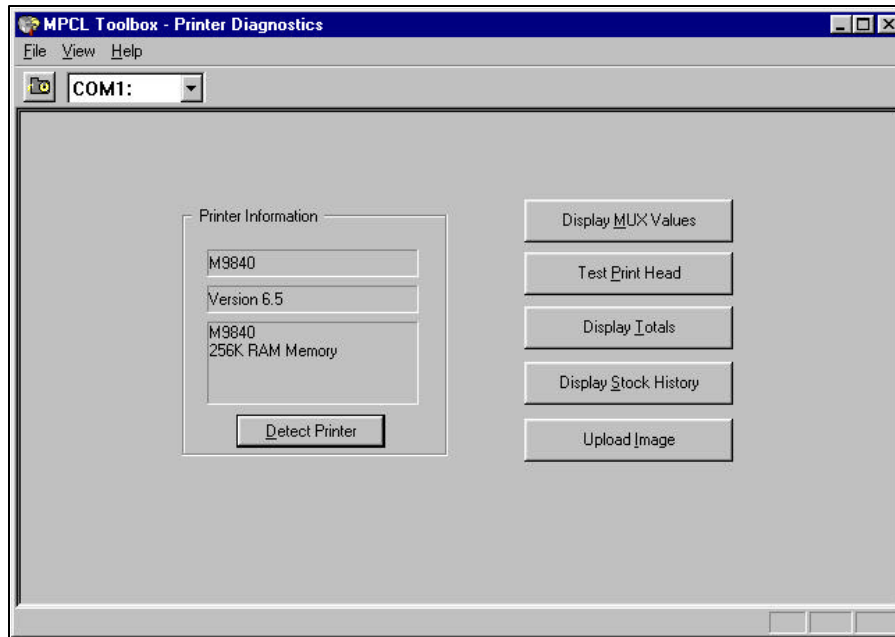
DOWNLOADING FILES TO THE PRINTER

You can download format and batch (*.FAB) files and others to the connected printer.

1.   From the File menu, select Download... You will see

```
Download File                                    ? ×
Look in:  [📁 MPCL Files      ▼]  [⬆] [📁*] [▦] [▤]

  [📄] 1220upca.fab
  [📄] 1510item.fab
  [📄] 2020upca.fab
  [📄] 4060comp.fab



File name:    [                    ]        [ Open ]
Files of type: [Print Files (*.fab)   ▼]    [ Cancel ]
```
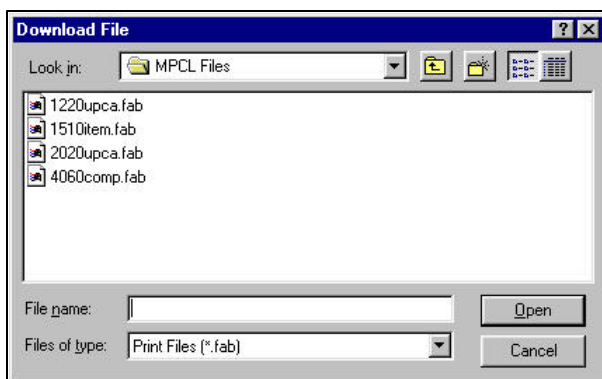
2.   Highlight the file to download and click Open. You see the message "Downloading..." while the file is sent. Four sample format and batch files are provided with this utility and saved in the C:\Program Files\Monarch Marking\MPCL Files directory. Change directories to send additional formats you have created.

DISPLAYING MUX VALUES

1. Click Display <u>M</u>UX Values to show the current values for each sensor, contrast setting, printhead temperature, battery voltage, and more.

MUX Readings	Current	High	Low	Delta
Die Cut Sensor	91 bits	92 bits	91 bits	1 bits
Black Mark Sensor	200 bits	200 bits	199 bits	1 bits
Dot Test	119 bits	119 bits	119 bits	0 bits
On-Demand Sensor	30 bits	30 bits	30 bits	0 bits
PC Board Revision	5 bits	5 bits	5 bits	0 bits
Head Temperature	136 bits	136 bits	136 bits	0 bits
Battery Voltage	196 bits	196 bits	196 bits	0 bits

☐ <u>S</u>cale values to Engineering Units   [OK]

The current voltages for the sensors are constantly monitored and updated. The displays correspond to the channels of the A/D converter on the CPU board. The high, low, and Delta readings are also displayed.

2. Click [OK] when you finished looking at the MUX values. You return to the main screen.

TESTING THE PRINTHEAD

1. Click Test <u>P</u>rint Head to perform a printhead test. The test checks for bad dots on the printhead. Depending on your printer, you may be able to print with up to four bad dots on the printhead.

Print Head Test ✕

Bad Dots   **0**

Resistance

Minimum   376 ohms
Average   388 ohms
Maximum   408 ohms

[OK]

2. Click [OK] when you are finished performing the printhead test. You return to the main screen.

DISPLAYING SERVICE TOTALS

1. Click Display <u>T</u>otals to display and modify the Service and Machine totals.

Display Totals

	Service Totals	Machine Totals
Total Inches:	0	0
High Energy Inches:	0	0
Labels:	0	0
Cut Jams:	0	0
Cuts:	0	0
Printed Inches:	0	0

☐ Edit Totals   [Clear]   [Clear]

[OK]   [Cancel]   [Apply]
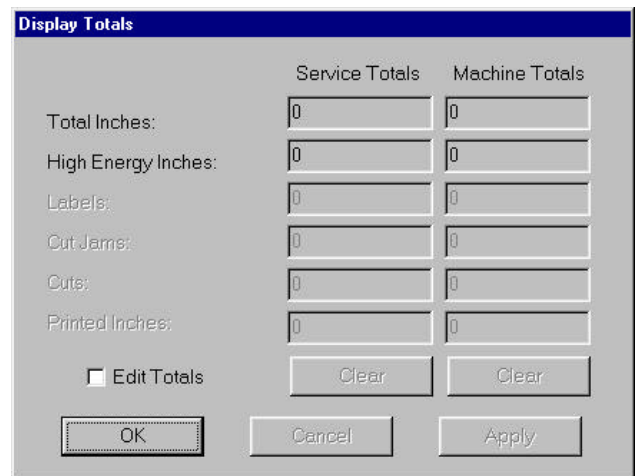
2. Click Edit Totals to modify the totals. You will be prompted to enter a password. After entering the password, click [OK]. (The password for modifying the service/machine totals is the common password [jmartin] for Monarch Marking service personnel.) If you enter the wrong password, you can still view the Service and Machine totals, but you cannot change them. If you entered the correct password, you will see

Display Totals		
	Service Totals	Machine Totals
Total Inches:	580	580
High Energy Inches:	0	0
Labels:	0	0
Cut Jams:	0	0
Cuts:	0	0
Printed Inches:	0	0
☑ Edit Totals	Clear	Clear
OK	Cancel	Apply

3. Click Clear to clear the total inches for Service or the machine. You can also adjust the high energy inches, labels, cut jams, cuts, and/or printed inches.

4. Click Apply to save the new settings.

5. Click [OK] when finished changing the totals. If you click [OK] before clicking Apply, the message, "Values have been modified, update printer? Yes or No." appears. Click Yes or No to continue. If you click Yes, the message, "This will change the internal values on the printer, continue? Yes or No." appears. Click Yes or No to continue. If you click Yes, the values are modified.

DISPLAYING STOCK HISTORY

1. Click Display Stock History to display the stock quality of the most recently printed labels/tags. You will see

Stock History					
Label	Length	Min	Max	Diff	Status
1 (Newest)	2.08"	3	137	134	Pass
2	2.09"	3	134	131	Pass
3	2.09"	2	133	131	Pass
4	2.07"	3	130	127	Pass
5	2.09"	3	134	131	Pass
6	2.09"	2	128	126	Pass
7	2.08"	3	133	130	Pass
8	2.09"	2	131	129	Pass
9	2.07"	2	137	135	Pass
10	2.08"	2	134	132	Pass
11	2.08"	2	141	139	Pass
12 (Oldest)	2.09"	2	140	138	Pass

OK

2. Label 1 represents the most recently printed label or tag. If only one label has been fed/printed, there will be information only for label 1.

The length is displayed in inches. The Min and Max are A/D readings used to determine feature location. The status indicates whether the printer viewed this label a good or bad label length.

3. Click [OK] when you are finished viewing the stock history.
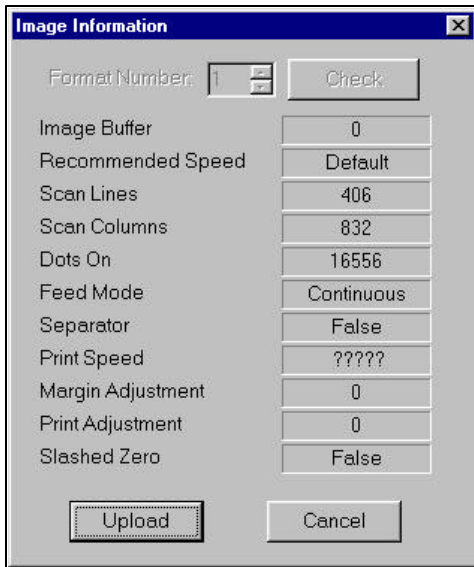
UPLOADING IMAGES

This feature allows you to upload an image from the printer's image buffer to a .BMP file. If you need to show a sample label in a .DOC or .XLS file, you can import the .BMP into your file. This eliminates the need to scan label samples.

To upload an image:

1. Download a file to the printer. You need an image in the printer's image buffer.

2. Click Upload Image. You will see

Image Information

Format Number: 1	Check
Image Buffer	0
Recommended Speed	Default
Scan Lines	406
Scan Columns	832
Dots On	16556
Feed Mode	Continuous
Separator	False
Print Speed	?????
Margin Adjustment	0
Print Adjustment	0
Slashed Zero	False

[Upload]   [Cancel]

Information about the image is displayed, such as the length and width of the image in dots (scan lines and scan columns), if batch separators are enabled, and the margin/print adjustments.

3. Click Upload. The message "Receiving data" appears while the image is sent from the printer's image buffer to the PC and converted to a .BMP file. The .BMP file is a true black and white Windows DIB BitMap file. Any program that can display BMP files can view this.

4. If installed, Microsoft ® Windows ® launches the Paint program and displays the file/format in your printer's image buffer. Use the Paint program to make any changes to the .BMP file and save it.

APPENDIX A. ERROR CODES

This appendix provides a listing of error codes that may be generated by the 9460 printer.

001	Format ID number must be **1** to **99**.
002	Name must be a printer-assigned name or be **1** to **8** characters inside quotes.
003	Action must be **A** (add) or **C** (clear).
004	Supply length is invalid (maximum is **4"**).
005	Supply width is invalid (maximum is **2"**).
006	Storage device must be **R** (volatile RAM).
007	Unit of measure must be **E** (English), **M** (Metric), or **G** (Dots).
010	Field ID number is outside the range **0** to **999**.
011	Field length exceeds **2710**.
012	Row field position is greater than the maximum stock dimension.
013	Column field position is greater than the maximum stock dimension.
014	Font style is invalid.
015	Character rotation must be **0** (0 degrees), **1** (90 degrees), **2** (180 degrees), or **3** (270 degrees).
016	Field rotation must be **0** (0 degrees), **1** (90 degrees), **2** (180 degrees), or **3** (270 degrees).
017	Field restriction must be **V** (variable) or **F** (fixed).
018	Code page selection defined in the field must be **1** (ASCII).
020	Vertical magnification must be **1** to **7**.
021	Horizontal magnification must be **1** to **7**.
022	Color must be **B**, **D**, **O**, **R**, or **W**.
023	Inter-character gap must be **0** to **99** dots.
024	Field justification must be **B** (balanced), **C** (centered), **E** (end), **L** (left), or **R** (right).
025	Data length is too long.
030	The bar code height is invalid (minimums are **1** (English), **2** (Metric), **1** (Dots)) or is not within the supply dimensions.
031	Human readable option must be **1** (no CD or NS), **5** (NS at bottom, no CD), **6** (CD at bottom, no NS), **7** (CD and NS at bottom) or **8** (no text).
033	Bar code density is invalid.
040	Line thickness must be **0** to **99** dots.
041	Line direction must be **0**, **90**, **180**, or **270**.
042	End row is invalid. Line segment or box end row is defined outside of printable area.

043	End column is invalid. Line segment or box end column is defined outside of printable area.
044	Dot pattern for line or box must be "" (literally just two double quotes).
045	Line length is defined beyond the maximum length of **3.72"**.
046	Line type must be **S** (segment) or **V** (vector).
051	Imaging value is defined as something other than **0**.
101	The format referenced by the batch is not in memory.
102	Print quantity is outside the range **0** to **25**.
104	Batch mode must be **N** (new) or **U** (update).
105	Batch separator in a batch control field must be **0** (Off).
106	Print multiple is outside the range **1** to **999**.
107	Cut multiple is out of range.
108	Multiple part supply is outside the range **1** to **5**.
109	Cut type specified is invalid.
200	Option number must be **1**, **31**, **50**, **51**, **or 52**.
201	Copy length is outside the range **0** to **255**.
202	Copy start position must be **1** to **255**.
203	Destination start position must be **1** to **255**.
204	Source field must be **0** to **999**.
205	Copy type must be **1** (copy after rules) or **2** (copy before rules).
206	Increment/Decrement selection must be **I** (increment) or **D** (decrement).
207	Incrementing start position must be **0** to **255**.
208	Incrementing end position must be **0** to **255**.
209	The incrementing amount must be **0** to **999**.
210	Security value for a PDF417 bar code must be **0** to **8**. Correct the value and resend the format to the printer.
211	Narrow element value is less than **1** or greater than **99**. Correct the value and resend the format to the printer.
212	Wide element value is less than **1** or greater than **99**. Correct the value and resend the format to the printer.
213	Dimension must be **1** to **30** for a column or **3** to **90** for a row on a PDF417 bar code.
214	Truncation code must be **S** (standard) or **T** (truncated bar code).
215	Aspect code must be **C** (columns) or **R** (rows).
216	Option definition must be **S** (set) or **T** (template).
217	Input device must be **D** (Default), **H** (Host), **K** (Keyboard), **N** (None), or **S** (Scanner).
218	Pad direction must be **L** (from left) or **R** (from right).
219	Pad character is outside the range **0** to **255**.
220	Check digit selection must be **G** to generate the check digit.
221	Primary or secondary price format is outside the range **1** to **15**.
222	Data type restriction is outside the range of **1** to **6**.
223	Option is not valid for the field.
224	Bar code inter-character gap must be **0** to **99** dots. (This value is also known as the additional character gap when using Option 50, Defining Bar Code Densities.)
251	Power up mode must be **0** (online).
252	Language selection must be **0** (English) or **4** (other).
253	Batch separator code in a supply setup packet must be **0** (off).

254	Slash zero selection must be **0** (standard zero).
255	Supply type must be **0** (black mark) or **1** (die cut).
256	Ribbon selection must be **0** (direct) or **1** (transfer).
257	Feed mode must be **0** (continuous) or **1** (on-demand).
258	Supply position is outside the range.
259	Contrast adjustment must be **-390** to **156** dots.
260	Print adjustment must be **-99** to **99** dots.
261	Margin adjustment must be **-99** to **99** dots.
262	Speed adjustment must be **0** (1.0 IPS).
263	Primary monetary symbol is invalid.
264	Secondary symbol selection must be **0** (none) or **1** (print secondary sign).
265	Monetary decimal places must be **0** to **3**.
266	Character string length in the control characters packet must be **5** (MPCL control characters) or **7** (ENQ/IMD command characters)
267	Baud rate selection must be **0** (1200), **1** (2400), **2** (4800), **3** (9600), **4** (19200), or **5** (38400). Resend the communication settings packet.
268	Word length selection must be **0** (7 bits) or **1** (8 bits). Resend the communication settings packet.
269	Stop bits selection must be **0** (1 bits), or **1** (2 bits). Resend the communication settings packet.
270	Parity selection must be **0** (none), **1** (odd), or **2** (even). Resend the communication settings packet.
271	Flow control selection must be **0** (none), **1** (DTR), **2** (CTS/RTS), or **3** (XON/XOFF). Resend the communication settings packet.
272	Internal code page selection must be **1** (ASCII).
273	Cut adjustment must be **-99** to **99** dots.
282	RS232 Trailer string is too long. Use a maximum of **3** characters.
283	ENQ Trailer string is too long. Use a maximum of **3** characters.
284	The buffer type must be **T** (Transmit), **R** (Receive), **I** (Image), **F** (Format), or **D** (Downloadable Fonts).
285	The storage device type in the memory configuration packet must be **R** (volatile RAM).
286	The buffer size is invalid.
287	The printhead width must be **244** to **812** dots.
288	The battery voltage must be **0** (15-volt battery) or **1** (12-volt battery).
289	The printer address specified in the communication settings packet must use *exactly* six characters.
290	Action must be **0** (disable), or **1** (enable) for the backfeed control packet or the printer is active.
291	Dispense position must be **50** to **200** dots and the backfeed distance is greater than the dispense position or the printer is active.
292	Backfeed distance must be **10** to **200** dots or the printer is active.
310	Check digit scheme number must be **1** to **10**.
311	Modulus must be **2** to **11**.
314	Check digit algorithm must be **D** (sum of digits) or **P** (sum of products).
325	Duplicating direction must be **0** (insert after) or **1** (insert before) in duplicate fields for graphics.
327	Amount of row adjustment must be **0** to **999** dots in duplicate fields for graphics.
328	Duplicate count must be **0** to **999**.
340	Bitmap line encoding must be **H** (hex) or **R** (run length).
350	Font selector must be **1** to **9999**.
351	Font data length must be **68** to **16384**.

352	Insufficient memory is available for the downloaded font.
380	Job request is invalid. Must be 0 to 4.
400	The character immediately following **{** is invalid.
401	Internal software failure.
402	Field separator is not in the expected location.
403	Record separator was not found.
404	Bad token, number, or string is too long.
405	Too many fields exist in the format. You cannot have more than 1000 fields in the format.
409	The printer memory is full. Delete unnecessary formats or graphics from memory. If you are using a graphic file that is very large, consider using another mapping method (such as run length encoding) to reduce the required memory.
410	Parity on the printer does not match the parity on the host. Check the parity setting under SETUP options.
411	Framing error. The printer cannot communicate with the host. Make sure the host is turned on, communication cables are connected correctly, port settings are correct, and communications are active. Check the baud rate, word length, and stop bits to make sure they match those at the host. Do not toggle between Microsoft Windows and MS-DOS while using the COPY command, or you will receive a framing error. Exit Windows **before** using the COPY command. Re-transmit the data.
412	There is a problem with flow control between the printer and the host. Make sure the printer and the host flow control settings match (both are DTR or both are XON/XOFF).
413	Online receive queue is full. Check your printer's XON/XOFF or DTR SETUP values to be sure there is not a flow control problem.
414	The internal keyboard buffer is full or you need a new keyboard.
415	The buffer size you defined exceeds the total available in your machine.
420	Internal software list error.
421	Internal software list error.
422	Duplicate internal name.
424	Internal software list error.
425	Internal software list error.
426	Internal software list error.
427	Internal software list error.
428	Internal software list error.
429	A field number appears more than once in a format.
430	The format uses a graphic file that cannot be found.
433	No format field for batch data record.
497	Parallel loopback test failed.
499	Serial loopback test failed.
571	Bar code length error.
572	Copy length error.
573	Price length error
574	No CD scheme or room for CD. The CD scheme in the batch does not fit the format or the field contains blanks.
575	The graphic included in your format could not be found.
601	Error occurred while imaging.
603	Batch not found for imaging.
611	Font, bar code or density is invalid. The font, bar code or density in the batch does not fit the format.
612	The data in this line of the batch is either missing or does not match the format.

613	Reference point off tag.
614	Portion of field off tag. There may be an invalid character in the packet. Make sure you did not enter the letter **O** for the number **0**.
615	Internal overfull error.
616	Dot shifting failed. A bad dot falls on a bar code that cannot be shifted.
618	Magnification must be **1** to **7**.
619	Bad JIS code for Kanji.
703	Calibration of different sized black marks.
704	Printer is out of supplies or has not sensed a supply mark within the specified number of inches. Check the supply tracking, supply marks, black mark sensor position, and supply roll for binding. Press the ⒶΔ button under the x icon to clear the error. Change the supply.
750	Printhead is overheated. Turn off the printer to let the printhead cool.
751	Printer did not sense a black mark when expected. The supply may be jammed. For errors 751-753, Check the supply tracking, supply marks, black mark sensor position, and supply roll for binding. If the error continues to appear, change the supply.
752	The printer sensed a mark in the wrong place.
753	The printer sensed a mark that is too long.
754	Ribbon fault.
755	Printhead is open.
756	The printer is out of supplies. Load supplies.
757	Load supplies. The calibrated supply length differs by plus or minus .25 inches from the format.
758	Check supply. Either the on-demand sensor is broken, or the supply is not seen. Adjust the on-demand sensor so it is over a white area on the supply, or set the unit to continuous mode.
759	Knife not moving.
760	Knife jammed.
761	Stacker is full.
763	Waiting to dispense label. Press the feed button.
764	Verifier failure.
765	Printhead failure. You need a new printhead.
766	Overfeed/Backfeed failure.
768	The printhead has more than 10 bad dots or is not connected. Make sure the printhead is connected and if necessary, call Customer Service to order a new printhead or printhead kit.
790	The printer is busy. Turn off the printer. Wait two seconds and turn it back on. Resend the packets.
800	A directory in flash memory is full.
801	Flash memory is full.
802	A directory in flash memory cannot be found.
803	There is no directory in flash memory.
810	A file in flash memory is not open.
811	A file in flash memory is already open.

812	The file in flash memory is full.
813	You cannot access flash memory.
820	An error occurred in the flash program.
821	An error occurred while erasing flash memory.
822	There is a flash ID error.
900	RAM test failure.
904	No configuration memory for native layer.
906	Power failure.
907	No configuration memory for application layer.
909	RAM is corrupted.
910	Warm start.
911	Virgin restart.
930	Error occurred while erasing flash memory.
931	Error occurred while writing to flash memory.
932	Error occurred while writing to RAM.
933	Communication parity error.
934	Communication framing error.
935	Communication buffer overrun.
936	Invalid record type.
937	Invalid hex data.
938	Invalid checksum.
939	Invalid record count.
940	Flash address is illegal.
950-999	AMD 29K illegal interrupt codes.

SYSTEM ERROR
VECTOR ##

can be:

2 Bus Error
3 Address Error
4 Illegal Instruction
5 Zero Division
6 CHK, CHK2 Instructions
7 TRAP Instructions
8 Privilege Violation
9 Trace
10 Line 1010 Emulator
24 Spurious Interrupt
48 User-defined vectors (48-255)

This error is fatal. If you receive it, reset and/or reflash the printer.

APPENDIX B. CARE & MAINTAINENCE

This chapter explains how to

- clean the printhead, platen roller, and the supply sensors.
- clear label jams.

Caution: Do not use sharp objects to clean the printhead. This may damage the printer and require a service charge.

CLEANING

The rate and frequency at which you print determines how often you must clean the printer.

You may need to clean the printhead and platen roller

- after using seven to ten (7-10) rolls of supplies.
- in extreme temperatures, humid conditions or a dirty environment.
- when you see voids in the print.
- after a label jam.

You may have to clean the supply sensors more often if you frequently receive supply error messages.

Use any of the following items to clean the printhead:

- a soft cloth moistened with isopropyl alcohol

    Caution: Use isopropyl alcohol on the interior areas only; never use it on the exterior.

- a Monarch cleaning pen (part number 114226)

To clean the printhead, platen roller, and supply sensors:

1. Turn **off** the printer by pressing and holding the ● button until the display is blank.

2. Open the supply door by pushing down on the release buttons on both sides of the printer. The supply door should swing open.
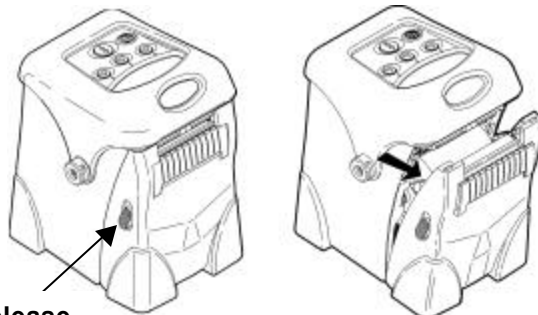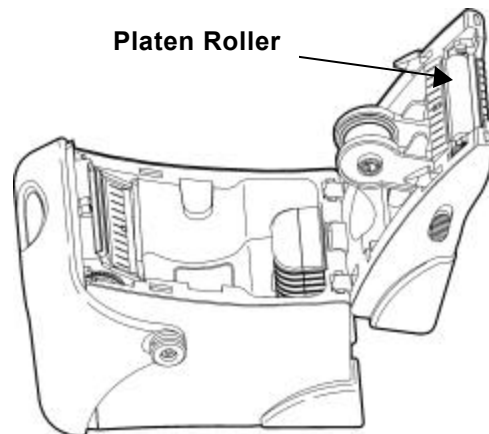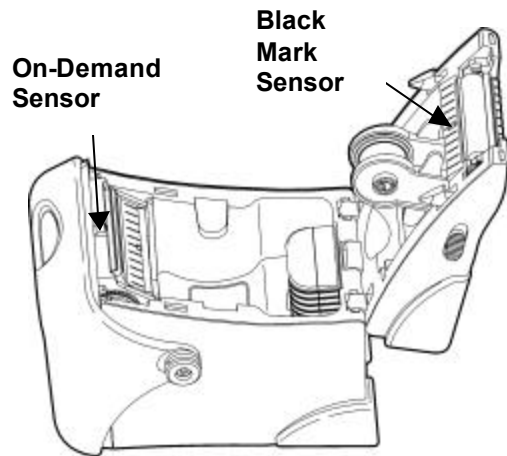
Release Button

3. Lay the printer on its back.

4. **Caution:** Ground yourself by using your field service static kit.

5. Clean the printhead with a clean soft cloth moistened with isopropyl alcohol, a cleaning pen, or a small brush.

    Note: Do not use sharp objects to remove adhesive or label particles from the printhead area.

Printhead
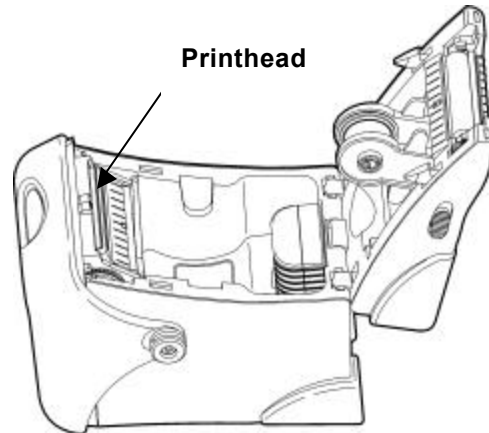
6. Clean the platen roller with a cleaning pen or a clean soft cloth moistened with isopropyl alcohol.

7. Turn the platen roller with your finger to clean the entire surface.

Platen Roller

8. Clean the on-demand and black mark sensors with a cleaning pen or a clean soft cloth moistened with isopropyl alcohol.

On-Demand Sensor

Black Mark Sensor

9. Reload the supply.

10. Close the supply door until the release buttons click into place.

11. Turn **on** the printer by pressing and holding the ● button until the display turns on.

CLEARING LABEL JAMS

When you are printing and jam occurs, you see a supply error message. To clear the jam:

1. Turn **off** the printer by pressing and holding the ● button until the display is blank.

2. Open the supply door by pushing down on the release buttons on both sides of the printer. The supply door should swing open.

3. If necessary, remove the roll of supplies.

4. Remove the jammed supplies and reload the supply.

5. Close the supply door.

6. Turn **on** the printer by pressing and holding the ● button until the display turns on.
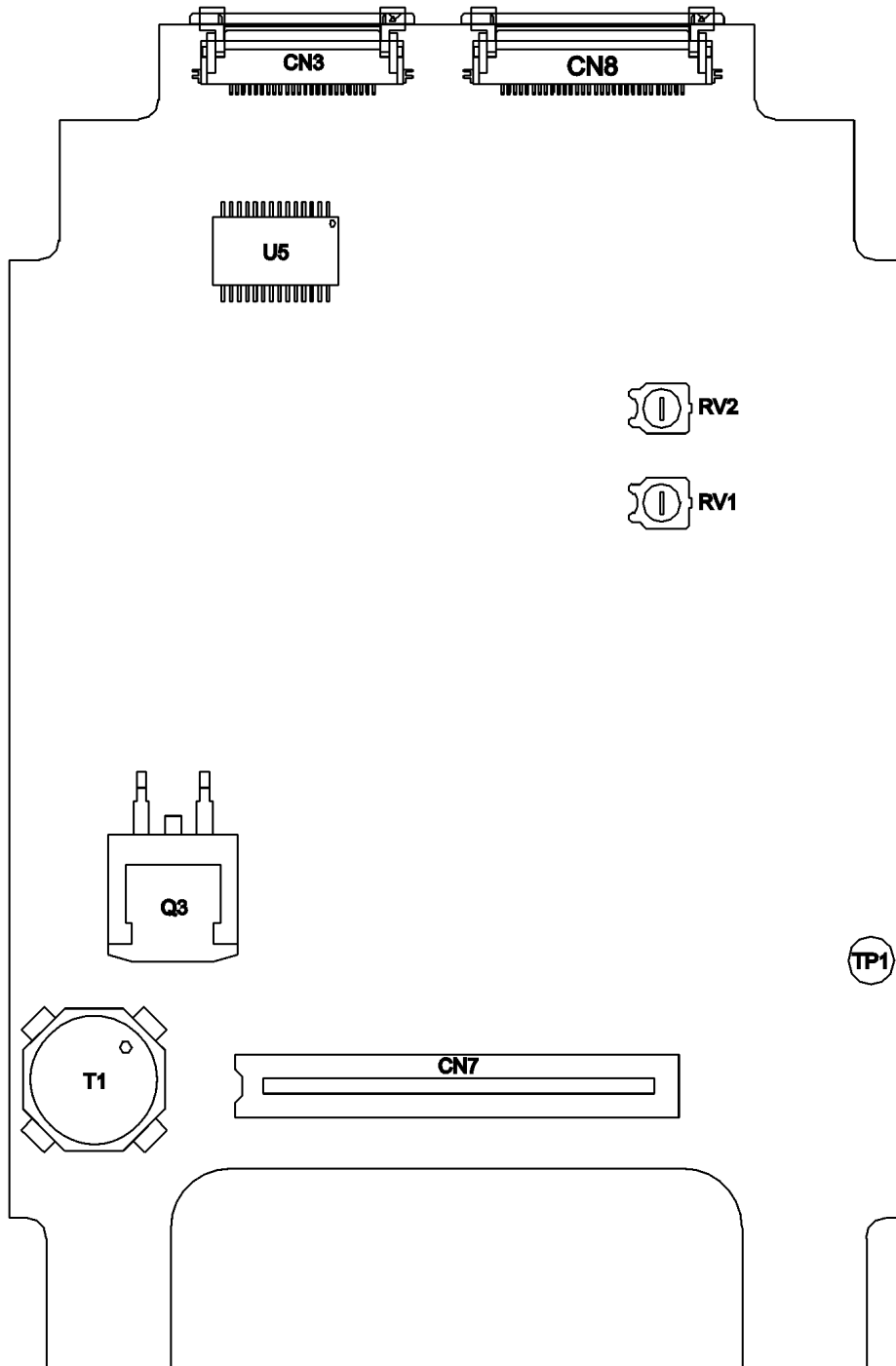
APPENDIX C. CIRCUIT CARD ASSEMBLY LAYOUTS
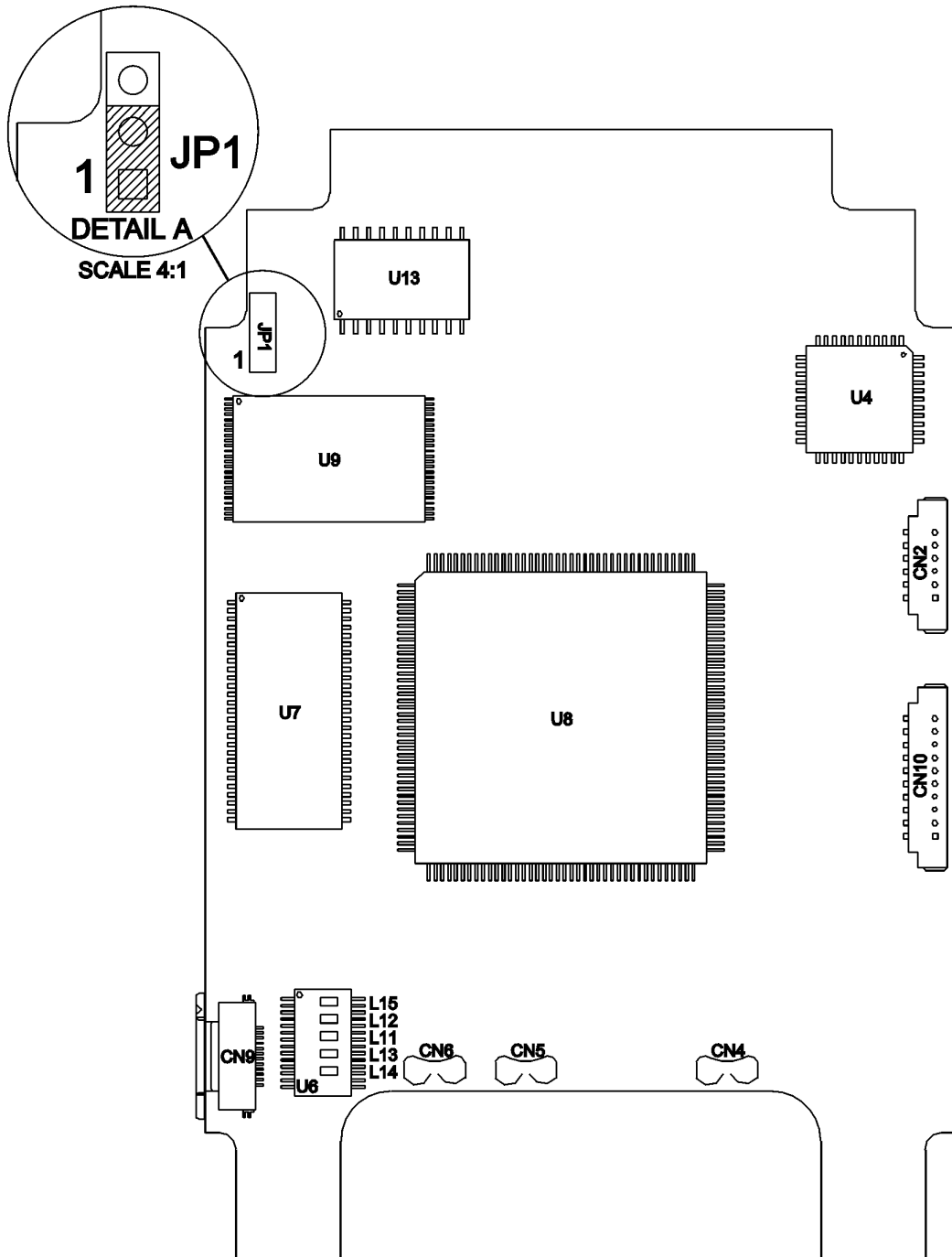
Figure C-1.   Main PCB (Primary Side).

Figure C-2.   Main PCB (Secondary Side).
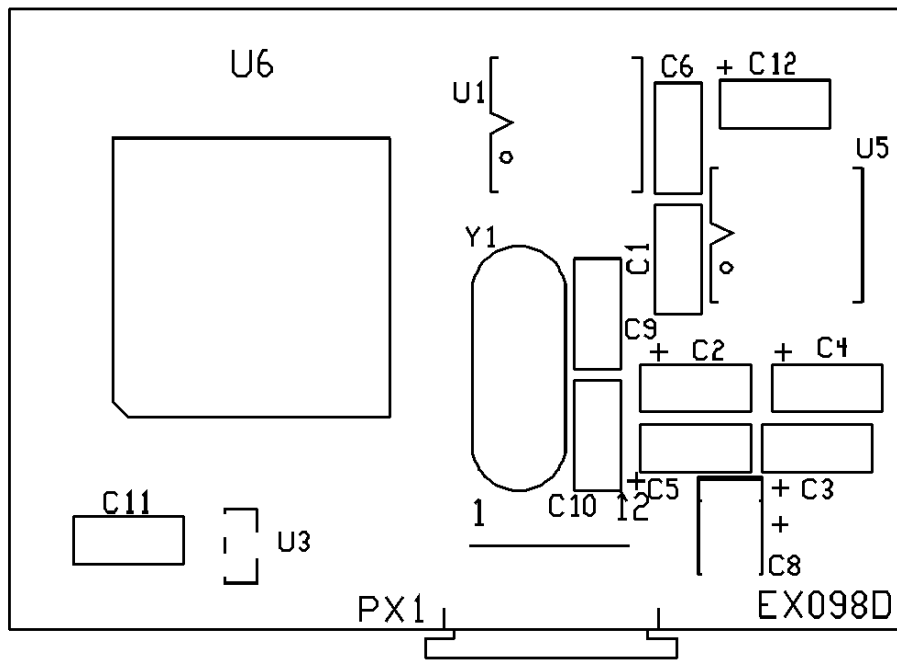
Figure C-3.   RF PCB.
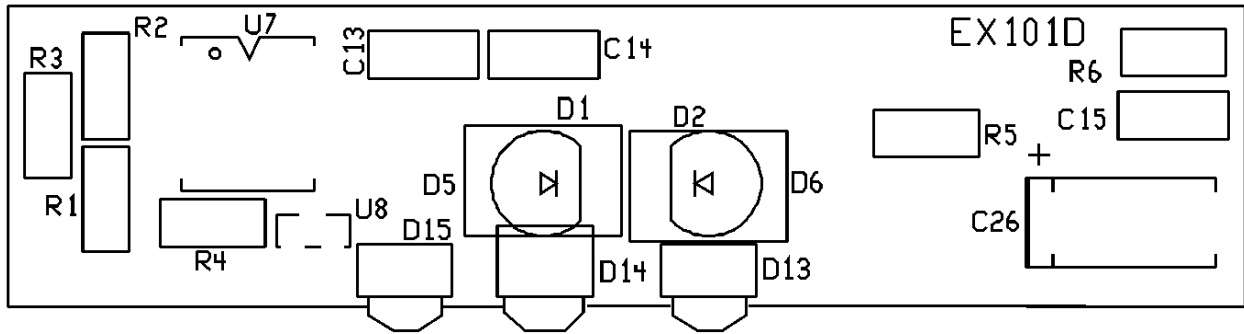

Figure C-4.   IrDA Processor Board.

Figure C-5. IrDA Transceiver.

For supplies, service, or assistance call toll free:

1-800-543-6650 (In the U.S.A.)
1-800-263-4650 (In Canada)

www.monarch.com